

(i) "Advanced Emission Speciation Methodologies for the Auto/Oil Air Quality Improvement Program—I. Hydrocarbons and Ethers," Auto Oil Air Quality Improvement Research Program, SP-920, 920320, SAE, February 1992.

(ii) "Advanced Speciation Methodologies for the Auto/Oil Air Quality Improvement Research Program—II. Aldehydes, Ketones, and Alcohols," Auto Oil Air Quality Improvement Research Program, SP-920, 920321, SAE, February 1992.

(iii) ASTM D 5197-91, "Standard Test Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology)."

(iv) Johnson J. H., Bagley, S. T., Gratz, L. D., and Leddy, D. G., "A Review of Diesel Particulate Control Technology and Emissions Effects—1992 Horning Memorial Award Lecture," SAE Technical Paper Series, SAE 940233, 1994.

(v) Keith *et al.*, ACS Committee on Environmental Improvement, "Principles of Environmental Analysis," The Journal of Analytical Chemistry, Volume 55, pp. 2210-2218, 1983.

(vi) Perez, J.M., Jabs, R.E., Leddy, D.G., eds. "Chemical Methods for the Measurement of Unregulated Diesel Emissions (CRC-APRAC Project No. CAPI-1-64), Coordinating Research Council, CRC Report No. 551, August, 1987.

(vii) Schuetzle, D., "Analysis of Nitrated Polycyclic Aromatic Hydrocarbons in Diesel Particulates," Analytical Chemistry, Volume 54, pp. 265-271, 1982.

(viii) Siegl, W.O., *et al.*, "Improved Emissions Speciation Methodology for Phase II of the Auto/Oil Air Quality Improvement Research Program—Hydrocarbons and Oxygenates", SAE Technical Paper Series, SAE 930142, 1993.

(ix) Tejada, S. B. *et al.*, "Analysis of Nitroaromatics in Diesel and Gasoline Car Emissions," SAE Paper No. 820775, 1982.

(x) Tejada, S. B. *et al.*, "Fluorescence Detection and Identification of Nitro Derivatives of Polynuclear Aromatic Hydrocarbons by On-Column Catalytic Reduction to Aromatic Amines," Ana-

lytical Chemistry, Volume 58, pp. 1827-1834, July 1986.

(xi) "Test Method for Determination of C1-C4 Alcohols and MTBE in Gasoline by Gas Chromatography," 40 CFR part 80, appendix F.

(c) *Exposure Analysis.* Using annual and projected production volume, marketing, and distribution data submitted as part of the basic registration data, specified in § 79.59(b), manufacturers shall provide a qualitative discussion of the potential public health exposure(s) of the general population and any special at-risk populations to the emission products of their fuel or additive product(s). The analysis accompanying a group submission shall address the characteristics of the cumulative exposure resulting from the use of all fuel or additive products in the group. Modeling and other quantitative approaches to the analysis are encouraged when the appropriate data is available.

(d) *Literature Search.* (1) Manufacturers of fuels and fuel additives shall conduct a literature search and compilation of information on the potential toxicologic, environmental, and other public welfare effects of the emissions of such fuels and additives. The literature search shall include all available relevant information from in-house, industry, government, and public sources pertaining to the emissions of the subject fuel or fuel additive or the emissions of similar fuels or additives, with such similarity determined according to the provisions of § 79.56.

(2) The literature search shall address the potential adverse effects of whole combustion emissions, evaporative emissions, relevant emission fractions, and individual emission products of the subject fuel or fuel additive except as specified in the following paragraph. The individual emission products to be included are those identified pursuant to the emission characterization procedures specified in paragraph (b) of this section, other than carbon monoxide, carbon dioxide, nitrogen oxides, benzene, 1,3-butadiene, acetaldehyde, and formaldehyde.

(3) In the case of the individual emission products of non-baseline or atypical fuels and additives (pursuant to § 79.56(e)(2)), the literature data need

not be submitted for those emission products which are the same as the combustion emission products of the respective base fuel for the product's fuel family (pursuant to § 79.55). For this purpose, data on the base fuel emission products for the product's fuel family:

(i) May be found in the literature of previously-conducted, adequate emission speciation studies for the base fuel, or for a fuel or additive/fuel mixture capable of grouping with the base fuel (see, for example, the references in paragraph (b)(5) of this section).

(ii) May be compiled while gathering internal control data during emissions characterization studies on the manufacturer's non-baseline or atypical product; or

(iii) May be obtained from various manufacturers in the course of their testing different additive(s) belonging to the same fuel family, or in the testing of a base fuel serving as representative of the baseline group for the respective fuel family.

(e) *Data bases.* The literature search must include the results of searching appropriate commercially available chemical, toxicologic, and environmental databases. The databases shall be searched using, at a minimum, CAS numbers (when applicable), chemical names, and common synonyms.

(f) *Search period.* The literature search shall cover a time period beginning at least thirty years prior to the date of submission of the reports specified in §§ 79.59(b) through (c) and ending no earlier than six months prior to the date on which testing is commenced or reports are submitted in compliance with this subpart.

(g) *References.* Information on base fuel emission inventories may be found in references in paragraphs (b)(5)(i) through (xi) of this section, as well as in the following:

(1) Auto/Oil Air Quality Improvement Research Program, Technical Bulletin #1, December 1990.

(2) Keith *et al.*, ACS Committee on Environmental Improvement, "Principles of Environmental Analysis," The Journal of Analytical Chemistry, Volume 55, pp. 2210–2218, 1983.

(3) "The Composition of Gasoline Engine Hydrocarbon Emissions—An Eval-

uation of Catalyst and Fuel Effects"—SAE 902074 and "Speciated Hydrocarbon Emissions from Aromatic, Olefin, and Paraffinic Model Fuels"—SAE 930373.

§ 79.53 Tier 2.

(a) *Generally.* Subject to the provisions of § 79.53(b) through (d), the combustion emissions of each fuel or fuel additive subject to testing under this subpart must be tested in accordance with each of the testing guidelines in §§ 79.60 through 79.68, except that fuels and additives in the methane and propane fuel families (pursuant to § 79.56(e)(1)(v) and (vi)) need not undergo the *Salmonella* mutagenicity assay in § 79.68). Similarly, subject to the provisions of § 79.53(b) through (d), the evaporative emissions of each designated evaporative fuel and each designated evaporative fuel additive subject to testing under this subpart must be tested according to each of the testing guidelines in §§ 79.60 through 79.67 (excluding § 79.68, *Salmonella typhimurium* Reverse Mutation Assay).

(b) *Manufacturer Determination.* Manufacturers shall determine whether the information gathered pursuant to the literature search in § 79.52(d) contains the results of adequately performed and adequately documented previous testing which provides information reasonably comparable to that supplied by the health tests described in §§ 79.62 through 79.68 regarding the carcinogenicity, mutagenicity, neurotoxicity, teratogenicity, reproductive/fertility measures, and general toxicity effects of the emissions of the fuel or additive. When manufacturers make an affirmative determination, they need submit only the information gathered pursuant to § 79.52(d) for such tests. EPA maintains final authority in judging whether the information is an adequate substitution in lieu of conducting the associated tests. EPA's determination of the adequacy of existing information shall be guided by the considerations described in paragraph (d) of this section. If EPA finds that the manufacturer has relied upon inadequate test data, then the manufacturer will not be considered to be in compliance until